REMARKS

This communication is a full and timely response to the final Office Action dated August 22, 2005 (Paper No./Mail Date 20050809), the period for response being extended because October 22, 2005 was a Saturday. By this communication, claims 11, 12, 17, 18, 27, 28, 39, 40, 53, 54, 63, 65, 73, and 74 have been amended.

Each of claims 11 and 12 have been amended to recite that said semiconductor thin film includes polycrystalline silicon having a first particle diameter, wherein said polycrystalline silicon is an irradiation converted substrate that in the prescribed region has a 30 to 80 nm layer of amorphous silicon or polycrystalline silicon having a second particle diameter that is smaller than said first particle diameter; a thin film transistor integrated in said prescribed region through said semiconductor thin film, wherein said converted polycrystalline silicon semiconductor film has a single-shot irradiated region. Support for the subject matter recited in these claims can be found variously throughout the claims, for example, in original claims 11 and 12 where applicable. No new matter has been added.

Each of claims 17, 18, 27, and 28 have been amended to recite that said semiconductor thin film includes polycrystalline silicon having a first particle diameter, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of amorphous silicon or polycrystalline silicon having a second particle diameter that is smaller than said first particle diameter. Support for the subject matter recited in these claims can be found variously throughout the claims, for example, in original claims 17, 18, 27, and 28 where applicable. No new matter has been added.

Claims 39 and 40 have been amended to recite that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate irradiated with pulse laser light having an emission time width from upstand to downfall of at least 50ns. Support for the subject matter recited in these claims can be found variously throughout the claims, for example, in original claims 39 and 40 where applicable. No new matter has been added.

Claim 53 has been amended to recite that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon

corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns in a non-oxidative atmosphere. Support for the subject matter recited in claim 53 can be found variously throughout the claims, for example, in original claim 53. No new matter has been added.

Claim 54 has been amended to recite that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns. Support for the subject matter recited in claim 54 can be found variously throughout the claims, for example, in original claim 54. No new matter has been added.

Claims 63 and 65 have been amended to recite that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is uniformly heated. Support for the subject matter recited in these claims can be found variously throughout the claims, for example, in original claims 63 and 65 where applicable. No new matter has been added.

Claims 73 and 74 have been amended to recite that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is cooled to a temperature lower than room temperature. Support for the subject matter recited in these claims can be found variously throughout the claims, for example, in original claims 73 and 74 where applicable. No new matter has been added.

Entry of this Amendment is proper under 37 C.F.R. §1.116 since the amendment: (a) places the application in condition for allowance (for the reasons discussed herein); (b) does not raise any new issues requiring further search and/or consideration; (c) satisfies a requirement of form asserted in the previous Office Action; and (d) places the application in better form for

appeal, should an appeal be necessary. The amendment is necessary and was not earlier presented because it is made in response to arguments raised in the final rejection. Entry of this amendment is respectfully requested. Reexamination and reconsideration in light of the above amendments and the following remarks is respectfully requested.

Claims 11, 12, 17, 18, 27, 28, 39, 40, 53, 54, 63, 65, 73, and 74 are pending where all of these claims are independent.

Rejection Under 35 U.S.C. §102

Claims 11, 27, 39, 53, 63, and 73 were rejected under 35 U.S.C. §102(b) as anticipated by *Noguchi et al.*—U.S. Patent No. 5,529,951. Applicant respectfully traverses this rejection.

Claim 11 recites a thin film semiconductor device comprising a semiconductor thin film, a gate insulating film accumulated on one surface thereof, and a gate electrode accumulated entirely within a prescribed region of said semiconductor thin film through said gate insulating thin film, wherein said semiconductor thin film includes polycrystalline silicon having a first particle diameter, wherein said polycrystalline silicon is an irradiation converted substrate that in the prescribed region has a 30 to 80 nm layer of amorphous silicon or polycrystalline silicon having a second particle diameter that is smaller than said first particle diameter; a thin film transistor integrated in said prescribed region through said semiconductor thin film, wherein said converted polycrystalline silicon semiconductor film has a single-shot irradiated region, and a cross sectional shape of said energy beam is adjusted with respect to said prescribed region to consist of irradiating said prescribed region in its entirety at a time by a single shot irradiation, so that characteristics of said thin film transistor are made uniform; and whereby said single-shot irradiated region is a borderless irradiated region; and wherein said film forming step and said irradiating step are alternately repeated without exposing said substrate to air, to accumulate said semiconductor thin film.

Claim 27 recites a thin film transistor having a laminated structure comprising a semiconductor thin film, a gate insulating film accumulated on one surface thereof, and a gate electrode accumulated entirely within a prescribed region of said semiconductor thin film through said gate insulating thin film, wherein said semiconductor thin film includes polycrystalline silicon having a first particle diameter, wherein said polycrystalline silicon is an irradiation converted 30 to 80 nm layer of amorphous silicon or polycrystalline silicon having a second particle diameter that is smaller than said first particle diameter; and said semiconductor

thin film is accumulated by alternately repeating said film forming step and said irradiation step without exposing said substrate to the air; and whereby said irradiated region is a borderless irradiated region.

Claim 39 recites a thin film transistor having a laminated structure comprising a semiconductor thin film, a gate insulating film accumulated on one surface thereof, and a gate electrode accumulated entirely within a prescribed region of said semiconductor thin film through said gate insulating film, wherein said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate irradiated with pulse laser light having an emission time width from upstand to downfall of at least 50ns; and a desired change to said energy intensity of said laser light from upstand to downfall of said pulse is applied to said polycrystalline silicon; and whereby said irradiated region is a borderless irradiated region; and wherein said film forming step and said irradiating step are alternately repeated without exposing said substrate to air, to accumulate said semiconductor thin film.

Claim 53 recites a thin film transistor having a laminated structure comprising a semiconductor thin film, a gate insulating film accumulated on one surface thereof, and a gate electrode accumulated entirely within a prescribed region of said semiconductor thin film through said gate insulating film, wherein said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns in a non-oxidative atmosphere; and whereby said irradiated region is a borderless irradiated region; and wherein said film forming step and said irradiating step are alternately repeated without exposing said substrate to air, to accumulate said semiconductor thin film.

Claim 63 recites a thin film transistor having a laminated structure comprising a semiconductor thin film, a gate insulating film accumulated on one surface thereof, and a gate electrode accumulated entirely within a prescribed region of said semiconductor thin film through said gate insulating film, wherein said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to

80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is uniformly heated; and whereby said irradiated region is a borderless irradiated region; and wherein said film forming step and said irradiating step are alternately repeated without exposing said substrate to air, to accumulate said semiconductor thin film.

Claim 73 recites a thin film transistor having a laminated structure comprising a semiconductor thin film, a gate insulating film accumulated on one surface thereof, and a gate electrode accumulated entirely within a prescribed region of said semiconductor thin film through said gate insulating film, wherein said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is cooled to a temperature lower than room temperature; and whereby said irradiated region is a borderless irradiated region; and wherein said film forming step and said irradiating step are alternately repeated without exposing said substrate to air, to accumulate said semiconductor thin film.

In summary, claims 11 and 27 recite that said semiconductor thin film includes polycrystalline silicon having a first particle diameter, wherein said polycrystalline silicon is an irradiation converted substrate that in the prescribed region has a 30 to 80 nm layer of amorphous silicon or polycrystalline silicon having a second particle diameter that is smaller than said first particle diameter; claim 39 recites that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate irradiated with pulse laser light having an emission time width from upstand to downfall of at least 50ns; claim 53 recites that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns in a non-oxidative atmosphere; claim 63 recites that said semiconductor thin film

includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is uniformly heated; and claim 73 recites that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is cooled to a temperature lower than room temperature.

Noguchi discloses a method of forming a polycrystalline silicon thin film where an amorphous silicon layer of a thickness preferably of 30 nm to 50 nm is formed on a substrate. Next, substrate heating is performed to set the amorphous silicon layer to preferably 350° C. to 500° C., more preferably 350° C. to 450° C. Then, at least the amorphous silicon layer is irradiated with laser light of an excimer laser energy density of 100 mJ/cm^2 to 500 mJ/cm^2, preferably 280 mJ/cm^2 to 330 mJ/cm^2, and a pulse width of 80 ns to 200 ns, preferably 140 ns to 200 ns, so as to directly anneal the amorphous silicon layer and form a polycrystalline silicon thin film. *See* Abstract.

Noguchi, however, fails to disclose, teach, or suggest at least that said polycrystalline silicon is an irradiation converted substrate that in the prescribed region has a 30 to 80 nm layer of amorphous silicon or polycrystalline silicon having a second particle diameter that is smaller than said first particle diameter as recited in claims 11 and 27; that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, <u>said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate irradiated with pulse laser light having an emission time width from upstand to downfall of at least 50ns</u>, as recited in claim 39; that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, <u>said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns in a non-oxidative atmosphere</u>, as recited in claim 53; that said

semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is uniformly heated, as recited in claim 63; and that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is cooled to a temperature lower than room temperature, as recited in claim 73. In fact, *Noguchi* fails to disclose or suggest a semiconductor film structure as recited in the above-identified claims.

To properly anticipate a claim, the document must disclose, explicitly or implicitly, each and every feature recited in the claim. *See* Verdegall Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). *Noguchi* fails to disclose, teach, or suggest every element recited in independent claims 11, 27, 39, 53, 63, and 73, therefore these claims are not anticipated by *Noguchi*. Accordingly, Applicant respectfully requests that the rejection of claims 11, 27, 39, 53, 63, and 73 under 35 U.S.C. §102 be withdrawn, and these claims be allowed.

Rejections Under 35 U.S.C. §103

Claims 12, 28, 40, 54, 65, and 74 were rejected under 35 U.S.C. §103(a) as unpatentable over *Noguchi* in view of *Tanaka et al.*—U.S. Patent No. 5,798,744. Applicant respectfully traverses this rejection.

Claim 12 recites a display device comprising a pair of substrates adhered to each other with a prescribed gap, and an electrooptical substance maintained in said gap, one of said substrates comprises a counter electrode, the other substrate comprises a pixel electrode and a thin film transistor driving said pixel electrode, and said thin film transistor comprises a semiconductor thin film and a gate electrode accumulated entirely within a prescribed region of one surface of said semiconductor thin film through a gate insulating film, wherein said semiconductor thin film includes polycrystalline silicon having a first particle diameter, wherein said polycrystalline silicon is an irradiation converted substrate that in the prescribed region has

a 30 to 80 nm layer of amorphous silicon or polycrystalline silicon having a second particle diameter that is smaller than said first particle diameter; a thin film transistor integrated in said prescribed region through said semiconductor thin film wherein said converted polycrystalline silicon semiconductor film has a single-shot irradiated region; and a cross sectional shape of said energy beam is adjusted with respect to said prescribed region to consist of irradiating said prescribed region in its entirety at a time by a single shot irradiation, so that characteristics of said thin film transistor are made uniform; and whereby said single-shot irradiated region is a borderless irradiated region; and wherein said film forming step and said irradiating step are alternately repeated without exposing said substrate to air, to accumulate said semiconductor thin film.

Claim 28 recites a display device comprising a pair of substrates adhered to each other with a prescribed gap, and an electrooptical substance maintained in said gap, one of said substrate comprises a counter electrode, the other substrate comprises a pixel electrode and a thin film transistor driving said pixel electrode, and said thin film transistor comprises a semiconductor thin film and a gate electrode accumulated entirely within a prescribed region of one surface of said semiconductor thin film through a gate insulating film, wherein said semiconductor thin film includes polycrystalline silicon having a first particle diameter, wherein said polycrystalline silicon is an irradiation converted substrate that in the prescribed region has a 30 to 80 nm layer of amorphous silicon or polycrystalline silicon having a second particle diameter that is smaller than said first particle diameter; and said semiconductor thin film is accumulated by alternately repeating said film forming step, where each additional formed film is about 1 nm, and said irradiation step without exposing said substrate to the air; and whereby said irradiated region is a borderless irradiated region.

Claim 40 recites a display device comprising a pair of substrates adhered to each other with a prescribed gap, and an electrooptical substance maintained in said gap, one of said substrate comprises a counter electrode, the other substrate comprises a pixel electrode and a thin film transistor driving said pixel electrode, and said thin film transistor comprises a semiconductor thin film and a gate electrode accumulated entirely within a prescribed region of one surface of said semiconductor thin film through a gate insulating film, wherein said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said

converted polycrystalline silicon corresponds to a cross-sectional area of the substrate irradiated with pulse laser light having an emission time width from upstand to downfall of at least 50ns, a desired change to said energy intensity of said laser light from upstand to downfall of said pulse is applied to said polycrystalline silicon; and whereby said irradiated region is a borderless irradiated region; and wherein said film forming step and said irradiating step are alternately repeated without exposing said substrate to air, to accumulate said semiconductor thin film.

Claim 54 recites a display device comprising a pair of substrates adhered to each other with a prescribed gap, and an electrooptical substance maintained in said gap, one of said substrate comprises a counter electrode, the other substrate comprises a pixel electrode and a thin film transistor driving said pixel electrode, and said thin film transistor comprises a semiconductor thin film and a gate electrode accumulated entirely within a prescribed region of one surface of said semiconductor thin film through a gate insulating film, wherein said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns, whereby said irradiated region is a borderless irradiated region; and wherein said film forming step and said irradiating step are alternately repeated without exposing said substrate to air, to accumulate said semiconductor thin film.

Claim 65 recites a display device comprising a pair of substrate adhered to each other with a prescribed gap, and an electrooptical substance maintained in said gap, one of said substrate comprises a counter electrode, the other substrate comprises a pixel electrode and a thin film transistor comprises a semiconductor thin film and a gate electrode accumulated entirely within a prescribed region of one surface of said semiconductor thin film through a gate insulating film, wherein said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is uniformly heated, whereby said irradiated region is a borderless irradiated region; and wherein said film forming step and said

irradiating step are alternately repeated without exposing said substrate to air, to accumulate said semiconductor thin film.

Claim 74 recites a display device comprising a pair of substrates adhered to each other with a prescribed gap, and an electrooptical substance maintained in said gap, one of said substrates comprises a counter electrode, the other substrate comprises a pixel electrode and a thin film transistor driving said pixel electrode, and said thin film transistor comprises a semiconductor thin film and a gate electrode accumulated entirely within a prescribed region of one surface of said semiconductor thin film through a gate insulating film, wherein said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width from upstand to downfall of at least 50ns when said substrate is cooled to a temperature lower than room temperature, whereby said irradiated region is a borderless irradiated region; and wherein said film forming step and said irradiating step are alternately repeated without exposing said substrate to air, to accumulate said semiconductor thin film.

In summary, claim 12 recites that said semiconductor thin film includes polycrystalline silicon having a first particle diameter, wherein said polycrystalline silicon is an irradiation converted substrate that in the prescribed region has a 30 to 80 nm layer of amorphous silicon or polycrystalline silicon having a second particle diameter that is smaller than said first particle diameter; claim 28 recites that said semiconductor thin film includes polycrystalline silicon having a first particle diameter, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of amorphous silicon or polycrystalline silicon having a second particle diameter that is smaller than said first particle diameter; claim 40 recites that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate irradiated with pulse laser light having an emission time width from upstand to downfall of at least 50ns; claim 54 recites that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area

of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns; claim 65 recites that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is uniformly heated; and claim 74 recites that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is cooled to a temperature lower than room temperature.

As discussed above, *Noguchi* discloses a method of forming a polycrystalline silicon thin film where an amorphous silicon layer of a thickness preferably of 30 nm to 50 nm is formed on a substrate. Next, substrate heating is performed to set the amorphous silicon layer to preferably 350° C. to 500° C., more preferably 350° C. to 450° C. Then, at least the amorphous silicon layer is irradiated with laser light of an excimer laser energy density of 100 mJ/cm^2 to 500 mJ/cm^2, preferably 280 mJ/cm^2 to 330 mJ/cm^2, and a pulse width of 80 ns to 200 ns, preferably 140 ns to 200 ns, so as to directly anneal the amorphous silicon layer and form a polycrystalline silicon thin film. The Office Action acknowledges that *Noguchi* fails to disclose, teach, or suggest at least a display device as recited in the above-identified claims, and relies on *Tanaka* to remedy this deficiency.

Applicant adds that *Noguchi* also fails to disclose, teach, or suggest at least that said polycrystalline silicon is an irradiation converted substrate that in the prescribed region has a 30 to 80 nm layer of amorphous silicon or polycrystalline silicon having a second particle diameter that is smaller than said first particle diameter as recited in claims 12 and 28; that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, <u>said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate irradiated with pulse laser light having an emission time width from upstand to downfall of at least 50ns</u>, as recited in claim 40; that said semiconductor thin film includes polycrystalline silicon,

wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, <u>said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns in a non-oxidative atmosphere</u>, as recited in claim 54; that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, <u>said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is uniformly heated</u>, as recited in claim 65; and that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, <u>said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is cooled to a temperature lower than room temperature</u>, as recited in claim 74.

Tanaka discloses a liquid crystal display apparatus has a pair of substrates, at least one of which is transparent, and a liquid crystal layer formed by enclosing a liquid crystal composition between the pair of the substrates, wherein a display region having a plurality of first semiconductor elements which are arranged in a matrix, and a peripheral circuits region having a plurality of second semiconductor elements for driving said plurality of first semiconductor elements, arranged at the periphery of the display region, are formed on the one substrate of said pair of substrates, and driver circuits for driving the peripheral circuits are bonded at a designated region on the one substrate of the pair of substrates. *See* Abstract.

Tanaka, however, fails to remedy the deficiencies of *Noguchi* and in particular, fails to disclose, teach, or suggest at least the above-identified elements recited in claims 12, 28, 40, 54, 65, and 74.

In summary, *Noguchi* and *Tanaka* either singly or combined fail to disclose, teach, or suggest at least that said polycrystalline silicon is an irradiation converted substrate that in the prescribed region has a 30 to 80 nm layer of amorphous silicon or polycrystalline silicon having a second particle diameter that is smaller than said first particle diameter as recited in claims 12 and 28; that said semiconductor thin film includes polycrystalline silicon, wherein said

polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, <u>said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate irradiated with pulse laser light having an emission time width from upstand to downfall of at least 50ns</u>, as recited in claim 40; that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, <u>said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns in a non-oxidative atmosphere</u>, as recited in claim 54; that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, <u>said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is uniformly heated</u>, as recited in claim 65; and that said semiconductor thin film includes polycrystalline silicon, wherein said polycrystalline silicon is an irradiation converted substrate having a 30 to 80 nm layer of non-single crystal silicon, <u>said converted polycrystalline silicon corresponds to a cross-sectional area of the substrate in the prescribed region that is irradiated with pulse laser light having an emission time width of at least 50ns when said substrate is cooled to a temperature lower than room temperature</u>, as recited in claim 74. In fact, the combined references fail to disclose a semiconductor film structure as recited in the above-identified claims. Thus, a *prima facie* case for obviousness has not been established.

To establish *prima facie* obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. <u>In re Royka</u>, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Moreover, obviousness "cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." <u>ACS Hosp. Sys. V. Montefiore Hosp.</u>, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). For at least the above reasons, Applicant respectfully requests that the rejection of claims 12, 28, 40, 54, 65, and 74 under 35 U.S.C. §103 be withdrawn, and these claims be allowed.

Conclusion

Based on at least the foregoing amendments and remarks, Applicant submits that claims 11, 12, 17, 18, 27, 28, 39, 40, 53, 54, 63, 65, 73, and 74 are allowable, and this application is in condition for allowance. Accordingly, Applicant requests a favorable examination and consideration of the instant application. In the event the instant application can be placed in even better form, Applicant requests that the undersigned attorney be contacted at the number listed below.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 18-0013, under Order No. SON-1718 from which the undersigned is authorized to draw.

Dated: October 24, 2005

Respectfully submitted,

By____________________

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